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AUTHOR Kebbel, Gary
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ABSTRACT

To develop a model of newspaper readership more closely related to explanation of readership behavior than prediction, a study used a combination of demographic and political participation variables in a multivariate analysis of data obtained in a national survey. Information from interviews of approximately 1,200 adults conducted in 1979 was analyzed to determine level of newspaper use and political activity. Demographic data were also collected. To determine the relationship of the various variables with newspaper readership, a path model that used the log-linear technique originated by L. Goodman (1972) was employed. Results indicated that older (55 and older), wealthy, more educated, politically active people were the most frequent newspaper readers. Overall, the best predictor of readership was political activity, followed by age, followed distantly by education. The findings suggest that since political activity is a good predictor of newspaper readership, and since it is possible to change a person's level of political activity, the newspaper industry should develop campaigns to draw young people into the political process. (FL)

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NEWSPAPER DIVISION

A MULTIVARIATE LOG-LINEAR MODEL OF NEWSPAPER USE

Gary Kebbel

Journalism Department
Northern Illinois University
DeKalb, Illinois 60115

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INTRODUCTION

Between 1950 and 1979, communications researchers produced 574 studies analyzing people's media use patterns, and particularly their newspaper use patterns.[1] Seventy-five of those studies (13 percent) were descriptions of newspaper readers and non-readers.[2] A common method in these studies has been to use the correlation matrices produced in bivariate analyses to predict newspaper readership from its correlation with other variables.

But as Weaver[3] and McCombs[4] recently have pointed out, predictive models do not explain why their phenomena occur and do not help us understand why they change. For instance, McCombs reports that "from 1960 to 1982 the proportion of adults reading a newspaper on a typical day declined from 80 percent to 67 percent. Yet during this same period, the proportion of the population with at least a high school education increased from about 40 percent to more than 70 percent."[5] Since education, along with age and income, consistently have had the highest correlations with newspaper readership,[6] we can see that simple prediction from demographic variables only, is not enough. Yet, slightly more than one third of the newspaper readership studies conducted between 1950 and 1979 have used only demographic variables to compare readers and non-readers.[7]

Gollin and Salisbury have argued that it is not enough to use demographic variables alone.[8] Gollin and Salisbury[9] and Weaver[10] have stated that sophisticated multivariate techniques should be used instead of simple cross-tabulations. Multiple regression is one method used more and more frequently to analyze readers and non-

readers, but Doyle and Fenwick point out why it should not be a method of choice for this sort of work.[11] Since the purpose of the readership studies is to discover which population subgroups do and do not read a newspaper regularly, it is substantively more appropriate to use an analysis technique that does not use the individual as the unit of observation and study, as regression does. Since regression analysis uses within-group, rather than between-group variation to fit the model, "regression coefficients may not reflect important differences between grouped data."[12]

Researchers have been limiting themselves practically and conceptually by relying on bivariate techniques, and this has stifled the development of good theories of newspaper use. McCombs has said newspaper researchers need to develop basic theories of why some people read newspapers and others do not, so that newspaper research distinguishes itself from brute empiricism.[13] Articles in a special issue of the Newspaper Research Journal discuss the relationship between civic culture (common social norms emphasizing the importance of citizen political participation) and the concomitant need to be informed.[14] In his review of newspaper readership and circulation studies between 1950 and 1976, McCombs stated that only about 3 percent of the 469 studies used such "psychological characteristics," such as "level of political interest" and "sense of civic duty" to analyze readership patterns. But it is just these kinds of variables that seem to be more useful than demographic variables in moving readership research closer to a theory. As McCombs reported, "These psychological variables yield more functional descriptions of readership. They come a step closer

to an explanation for readers' behavior."[15]

This paper will present a combination of demographic and political participation variables in a multivariate analysis to help develop a model of newspaper readership. The purpose is to begin to move away from prediction and move closer to explanation.

An index of political activity will be used as one of the dependent variables in this analysis because use and gratification research empirically supports the strength and importance of the broad cultural norm to be at least minimally informed about happenings in the world, either for the sake of being informed or to have discussions with others.[16] An informed electorate is essential to the optimal functioning of our democratic system and is the goal of the libertarian theory of the press. The libertarian theory of the press states that as many voices as possible should be heard so that from the competing clamor of untruth, half-truth and truth, people will be able to discover truth and be guided by it. A free marketplace of ideas is the key to the libertarian theory of the press. When the legal system allows competing ideas to be heard in the free marketplace of ideas, the electorate has the best opportunity to be informed. Then the political system that is governed by the electorate's will can function at its ideal level. Consequently, the strength in the individual of the civic culture or the social norm that touts the duty and responsibility to be informed and to participate in politics at least by voting should help explain varying levels of media use.[17] It is hypothesized that this variable will be a strong predictor of newspaper readership, even in a multivariate model.

METHODS

The Survey

The questions under investigation here are part of a larger national survey conducted in 1979 under a National Science Foundation grant.[18] A multi-stage cluster sample of households yielded 1635 personal interviews. The response rate was 75 percent. In this analysis, the dependent variable is newspaper use, as measured by the question, "About how often do you read a newspaper?" Responses originally were categorized on a five-point scale, ranging from "every day" to "never." The five-point scale was trichotomized into those who read a newspaper daily (60 percent), those who read it a few times a week (19 percent) and those who read it once a week or less, including those who never read a daily newspaper (21 percent).

The independent variables are gender, age, education, income and the index of political activity. Forty-seven percent of the sample was male and 54 percent was female. Age was trichotomized into a 17- to 34-year- old group (41 percent), a 35- to 54-year-old group (30 percent) and an older than 55 group (29 percent). Education was dichotomized into those who have had some college (15 percent) and those who have had none (85 percent). Income was measured on an eight-point scale and trichotomized into a three-point scale of those earning less than $10,000 a year (25 percent), those earning between $10,000 and $20,000 a year (33 percent) and

those earning more than $20,000 a year (34 percent). About 9 percent did not know their annual income or refused to give it. The index of political activity was created from affirmative responses to the following questions:

--Have you voted in a presidential election?

--Have you voted in a local or state election?

--Have you worked for a political party or candidate?

--Have you gone to a political meeting to hear a candidate speak?

--Have you asked someone to vote for your candidate or party?

--Have you worn a campaign button or displayed a campaign poster?

--During the last three or four years, have you written or spoken to any public employee or official about some political issue or problem?

With the possibility of answering "yes" to none or all of the statements above, the political activity index scale ranged from zero to seven. The modal response, given by 27 percent of the population surveyed, was two, meaning that 27 percent of those surveyed had participated in at least two of the political activities on the scale. Twenty-three precent of the respondents participated in none of the activities, and 4 percent did them all.

The Technique

After the multivariate distribution of newspaper readership by gender, age, education and income is presented, the first question to be studied is what are the significant relationships of these variables with newspaper readership? To show this, a path model using the log-linear technique originated and described by Goodman will be constructed.[19] This path model will be a series of

regression-like models (called logits) that predict the direct or main effects of one or more independent variables on a dependent variable. The relationship between the first two variables in the model will be determined by the bivariate log-linear relationship between the two variables, and the relationship of those two variables to the third one is determined by a logit model that predicts the direct effects of the first two variables on the third. This process continues until the direct effects of all the independent variables on the dependent variable is discovered.

To then determine the relative strength of the significant, direct paths to the dependent variable, a log-linear logit analysis will be constructed, using the methods described by Feinberg[20] and by Goodman.[21] According to Miller and Dran,

> a logit analysis is similar to a regression in quantitative analysis, but the logit is used to predict cell frequencies in a cross-tabulation, rather than individual case scores, as in a regression analysis. Within the logit analysis technique, the Coefficient of Multiple Partial Determination (CMPD) is a good measure of the relative explanatory power of each of several variables in a model. When applied to the predictive power of the total model, the CMPD is analogous to multiple R squared in a regression analysis. When applied to the individual terms of the model, the CMPD is analogous to a partial correlation coefficient in a regression analysis.[22]

The Data

The first multivariate relationship studied was that of the demographic variables on newspaper readership. (See Table 1). The purpose was to see if any of the four demographic variables is so relatively weak as a predictor, in comparison with the others that it could be dropped out of the model before the index of political activity was added. In this way, the resulting model could be

as parsimonious as possible. The intent also is to minimize zero cells and to maximize the number of cases in each cell. If logic and theory permit limiting or reducing the number of variables, then for the sake of parsimonious analysis, it is better to do so.

TABLE 1

A Multivariate Distribution of Daily Newspaper Readers

Age	Education	Income	Daily Newspaper Readership			
			Males		Females	
Young	No College	Low	46%	(N=17)	54%	(N=20)
		High	68	(61)	32	(29)
	College	Low	54	(7)	46	(6)
		High	50	(17)	50	(17)
Old	No College	Low	33	(38)	67	(77)
		High	51	(30)	49	(29)
	College	Low	0	(0)	100	(4)
		High	52	(14)	48	(13)

Table 1 shows the multivariate relationships of the independent variables with newspaper readership. For example, 46 percent of low-income young men and 54 percent of low-income young women with less than a college education read a newspaper daily, compared to 33 percent of the older men and 67 percent of the older women in the

same education and income grouping. This is a change of -13 percentage points for men and +13 percentage points for women.

Education seems to have its strongest relationship with daily newspaper readership in the young, high-income groups, where 68 percent of the young, high-income males and 32 percent of the young, high-income females with high school educations read a newspaper daily, compared to 50 percent of the young, high-income males and females with college educations. This is a change of -18 percentage points for men and +18 percentage points for women. It appears that increased education is related to decreased newspaper reading in some subgroups of men and to increased newspaper reading in some subgroups of women.

In all the cells except those for young, college-educated men and women, low and high income also seem to be associated with newspaper reading. For instance, 46 percent of young men with low incomes and no college education read a newspaper daily. This figure increases 22 percentage points when the young men with low incomes have continued their education beyond high school. Interestingly, the relationship is reversed for women. Fifty-four percent of young women with low incomes and no college education read a newspaper daily. This figure declines by 22 percentage points for young women with low incomes and an education extending beyond high school. (Perhaps this group of women is in the childbearing years and also is working and caring for a home and family, so that little time is left for daily newspaper reading.)

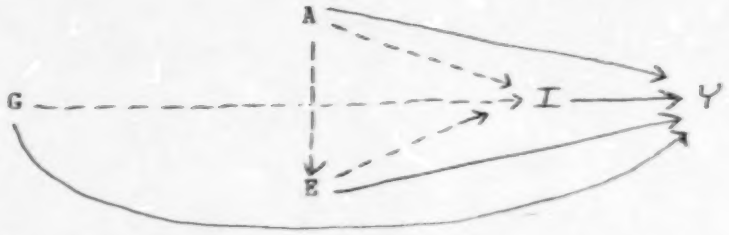
As can be seen from this brief analysis, there are many different relationships in Table 1, and it is not easy to tell if,

for example, it is one's gender or one's income level that is causing some of the differing male-female effects. In Figure 1, the path model constructed from logit tables shows that all the demographic variables have direct effects, significant at the .05 level, predicting to the dependent variable. In addition, gender and age predict income and education, while education also predicts income.

Although this information is helpful, it will be more useful to know the relative strengths of each of the predictors, or direct paths, to daily newspaper readership. This is accomplished through the construction of a logit table. The logit analysis for daily newspaper readership shows age and income to be the strongest predictors. Thirty-nine percent of the mutual dependence, or variance, is accounted for by age, 17 percent is attributable to income and 15 percent is accounted for by education. Together, these two variables account for about 56 percent of the mutual dependence. (See Table 2). The entire model accounts for about 73 percent of the mutual dependence, but gender only contributes 2 percentage points to that total. Since age, income and education are the two best predictors, gender will be dropped from the next analysis.

So far, all four of the independent demographic variables have significant direct effects on newspaper readership, but age, income and education have the highest relative predictive power, accounting for nearly all of the model's total prediction power. The effects of age, income and education are positive. Older respondents tend to be much more regular readers than younger respondents.

Figure 1: A Path Model to Predict Newspaper Readership



LEGEND

G=Gender E=Education Y=Daily Newspaper Reading, A=Age
I=Income

----Indirect paths significant at the .05 level
——— Direct paths significant at the .05 level

TABLE 2

A Logit Model to Predict Newspaper Readership

Models	df	LRX²	CMPD
H1: GAEI,Y	70	258.35	----
H2: GAEI,YA	66	157.84	.389
difference due to YA	4	100.51	.389
H3: GAEI,YA,YE	64	119.57	.537
difference due to YE	2	38.27	.148
H4: GAEI,YA,YE,YI	60	76.01	.706
difference due to YI	4	43.56	.169
H5: GAEI,YA,YE,YI,YG	58	70.23	.728
difference due to YG	2	5.78	.022

LEGEND

G=Gender
A=Age
E=Education
I=Income
Y=Newspaper reading

df=Degrees of Freedom
CMPD=Coefficient of Multiple-Partial Determination
LRX²=Liklihood Ratio Chi-Square

Wealthier people tend to be better readers than poor people. Better educated people tend to read newspapers more frequently than lesser educated people. Gender has no effect at low or high levels of readership, but shows a relationship at moderate levels of readership, with women more likely to be frequent readers. The effects of age, income and political activity, as well as those of age, education and political activity on daily newspaper readership now will be examined in separate models so that the models may be as parsimonious as possible and so that the different interactions may be examined.

A MULTIVARIATE DISTRIBUTION OF AGE, INCOME AND POLITICAL ACTIVITY ON DAILY NEWSPAPER READERSHIP

Table 3 shows that level of political activity is correlated with daily newspaper readership. For example, 42 percent of young people with high incomes and low levels of political activity read a newspaper daily, while 71 percent of young people with high incomes and high levels of political activity read a newspaper daily. This is an increase of 29 percentage points. This form of the relationship holds for all the subgroups. The previously discovered relationships of age and income with levels of newspaper reading remain. The older and the wealthier tend to be more frequent readers than the younger and/or poor respondents.

Although the table shows seemingly strong relationships between newspaper use and each of the independent variables, it is important to know the relative strength of each of the variables, controlling for the others. To do this, a log-linear path model is constructed. (See Figure 2).

Every direct and indirect association in the model is statistically significant. Age predicts to income and political activity, and controlling for the latter, also predicts to newspaper readership. Income predicts to political activity, and controlling for activity, also predicts to readership. Political activity predicts directly to readership. This figure shows the strength and importance of age and income in the model. Each variable predicts to political activity and also predicts to newspapers. The effects

Table 3

A Multivariate Distribution of Age, Income and Political Activity on Daily Newspaper Readership

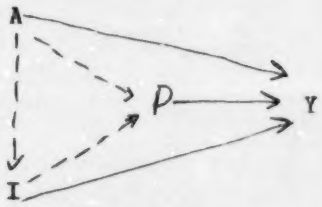
Age	Income	Political Activity	Daily Newspaper Readership	N
Low	Low	Low	28%	94
		High	48	21
	High	Low	42	74
		High	71	55
High	Low	Low	46	82
		High	71	44
	High	Low	80	5
		High	92	36

of age and income are not absorbed by political activity so that it alone predicts to newspaper readership.

The directions of the indirect relationships show that older and wealthier people tend to be more politically active than younger and/or poorer people. Older people tend to have less income, as a group, than younger or middle-aged people, presumably because older people are living on fixed moderate-to-poor retirement incomes. The directions of the direct relationships show that older, wealthier and more politically active people are more frequent newspaper readers than their counterparts.

Now it is important to know the relative strengths of each of the direct paths, or predictors, to newspaper readership. (See Table 4). To learn this, another logit table will be constructed. The best predictor of newspaper readership is political

Figure 2: A Path Model to Predict Newspaper Readership



LEGEND

A=Age P=Political activity
I=Income Y=Newspaper Readership

----Indirect paths significant at the .05 level
—— Direct paths significant at the .01 level

---

activity, which explains 46 percent of the mutual dependence, or variance, in the table. Substantively, this is similar to saying that if someone's level of political activity is known, then errors made when predicting their frequency of newspaper readership will be reduced by 46 percent. Political activity is quite a good indicator of frequency of newspaper readership.

TABLE 4

A Logit Model to Predict Newspaper Readership

Models	df	LRX^2	CMPD
H1: AIP,Y	52	261.53	----
H2: AIP,YP	48	140.49	.463
difference due to YP	4	121.04	.463
H3: AIP,YP,YI	44	116.81	.554
difference due to YI	4	23.28	.091
H4: AIP,YP,YI,YA	40	38.22	.855
difference due to YA	4	78.59	.301

LEGEND

A=Age
I=Income
P=Political Activity
Y=Newspaper Readership

df=Degrees of freedom
LRX^2=Liklihood Ratio Chi-Square
CMPD=Coefficient of Multiple Partial Determination

Income was entered into the model next, and it accounted for an additional 9 percent of the mutual dependence. This means that even after the effects of political activity are accounted for, income

has further explanatory power.

Age, added last, accounted for an additional 30 percent of the mutual dependence. Holding constant political activity and income, age still has a significant positive association with newspaper readership.

All three variables account for about 86 percent (when rounding) of the mutual dependence in the table. The hypothesis about the strength of political activity is confirmed. The best predictor is political activity (46 percent), followed by age (30 percent) and income (9 percent). This means that the major factor in predicting frequent newspaper readership (using this model) is a high level of political activity--doing something more than just voting in national and local elections. Next most important is being 55-years-old or older. Finally, having an annual household income higher than $20,000 also predicts to more frequent newspaper readership, but income's effect is much less than that of political activity or age. The remaining 14 percent of mutual dependence is attributable to interaction effects at various levels of the variables.

A MULTIVARIATE DISTRIBUTION OF AGE, EDUCATION AND POLITICAL ACTIVITY ON DAILY NEWSPAPER READERSHIP

Table 5 shows that when education replaces income, the positive effects of political activity on daily newspaper readerhsip remain. For instance, 31 percent of young people with a high school education and low political activity read a newspaper daily, while

55 percent of young people with a high school education and high political activity read a newspaper daily. This form of the relationship also is true for the other subgroups. As with income, those higher on the education scale, read more than those with less education.

Again, to show the relative strengths of the relationships among each variable when controlling for the others, a log-linear path model is constructed.

The model shows all indirect and direct associations are significant. (The indirect paths are significant at least at the .05 level, and the direct paths are significant at the .01 level.) Age, education and political activity have significant positive relationships with newspaper readership, just as in the previous model where the variables were age, income and political activity. Age predicts to education and political activity, and controlling for education and political activity, also predicts directly to newspaper readership. Education also predicts to political activity and predicts directly to newspaper readership. Even after the effects of age are filtered through education and political activity, and the effects of education are filtered through political activity, these two variables still predict directly to newspaper readership, along with political activity.

The directions of the indirect relationships show that older and more educated people tend to be more politicaly active than their counterparts. The directions of the direct relationships show that older, more educated and more politically active people tend to be more frequent newspaper readers than younger, less educated and

Table 5

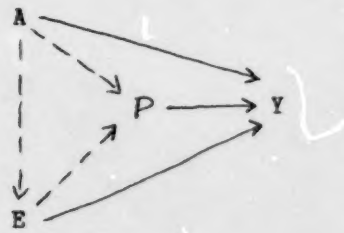
A Multivariate Distribution of Age, Education and Political Activity on Levels of Daily Newspaper Readership

Age	Education	Political Activity	Daily Newspaper Readership	N
Low	High School	Low	31%	88
		High	55	49
	College	Low	54	7
		High	76	31
High	High School	Low	55	65
		High	81	75
	College	Low	0	0
		High	96	26

less politically active people.

A logit model constructed to show the relative strengths of the direct paths to newspaper readership shows political activity again to be the best predictor, followed by age and education. (See Table 6). Political activity explains 55 percent of the mutual dependence or variance in the model--9 percent more than it did when the model contained income instead of education. Education, entered next in the model, only explained an additional 5 percent of the mutual dependence. This compares to the 9 percent explained by income in the previous model. Age, entered last, accounted for an additional 35 percent of the mutual dependence, compared to 30 percent in the income model (Table 4).

Figure 3: A Path Model to Predict Newspaper Readership



LEGEND

A=Age
E=Education
P=Political Activity
Y=Daily Newspaper Readership

----Indirect paths significant at the .05 level
——— Direct paths significant at the .01 level

TABLE 6

A Logit Model to Predict Newspaper Readership

Models	df	LRX2	CMPD
H1: AEP,Y	34	242.26	----
H2: AEP,YP	30	109.33	.549
difference due to YP	4	132.93	.549
H3: AEP,YP,YE	28	97.72	.597
difference due to YE	2	11.61	.048
H4: AEP,YP,YE,YA	24	13.73	.944
difference due to YA	4	83.99	.347

LEGEND

A=Age
E=Education
P=Political Activity
Y=Newspaper Readership

df=Degrees of Freedom
LRX2=Liklihood Ratio Chi-Square
CMPD=Coefficient of Multiple Partial Determination

The positive association of age with newspaper readership occurs in these models even when the effects of education and political activity are held constant. The total model explains about 95 percent of the mutal dependence, compared to about 85 percent in the model with income instead of education. The difference is explained by the fact that there is a larger percentage of mutual dependence explained through higher-order interactions in the income model than in the education model. Being politically active, being 55-years-old or older and having a college education predict to frequent newspaper readership. The

best predictor is political activity, followed by age, followed distantly by education.

DISCUSSION

The importance of this study is that it helps move a step closer to explanation of newspaper readership, rather than just prediciton. It does this by using demographic and behaviorial variables in the same model and assessing the relative importance of each variable's association with newspaper readership. When, for instance, we know that older, wealthy, more educated, politically active people are the most frequent newspaper readers, and we know that young, wealthy, more educated, politically active people also are frequent newspaper readers, (though not as frequent as their older counterparts), then we can see that if the modal age of the population shifts downward, as it did during during the 1960s and 1970s, there still are possible strategies for keeping newspaper readership at least stable.

The path model and logit table show that because political activity is such a good predictor of newspaper readership, and since it is easier to change a person's level of political activity than his or her age or income, the newspaper industry should develop camapigns aimed at drawing young people into the political process. Young people are less politically active than older people and they read newspapers less frequently. Since this readership pattern is not totally a function of age, income or education, it should pay for newspapers to do such things as sponsor voter registration drives, encourage schools to use the newspaper in civics classes,

study and then write about the political issues that interest young people, sponsor neighborhood councils in which there are ample membership slots for young people and sponsor bipartisan political projects in which members of the town's service clubs that have younger members could participate.

NOTES

1. Paula Poindexter, "Newspaper Readership and Circulation--An Update: 1977-1979," ANPA News Research Report, No. 22, 28 September 1979, p. 3.

2. Poindexter, p. 3.

3. David Weaver, "On Using Newspaper Readership Research," Newspaper Research Journal, Vol. 2, No. 4 (1981), p. 18.

4. Maxwell McCombs, "Newspapers and the Civic Culture," Newspaper Research Journal, Vol. 4, No. 4 (1983), pp. 5,9.

5. McCombs, p. 5.

6. Leonard Tipton, "ANPA Newspaper Readership Studies," ANPA News Research Report, No. 13, 12 July 1978, p. 2. Also see Leo Bogart, Press and Public, (Hillsdale, N. J.: Lawrence Erlbaum Associates, 1981), pp. 57, 67. Albert Gollin and Paul Salisbury, "Three Ways of Assessing Newspaper Readership Demographics," Newspaper Research Journal, Vol. 1, No. 3 (1980), pp. 27-36. David Weaver and Virginia Dodge Fielder, "Civic Attitudes and Newspaper Readership in Chicago," Newspaper Research Journal, Vol. 4 No. 4 (1983), pp. 11-18.

7. Poindexter, pp. 3-4.

8. Gollin and Salisbury, pp. 34.

9. Gollin and Salisbury, pp. 27-36.

10. Weaver, pp. 15-21.

11. Peter Doyle and Ian Fenwick, "The Pitfalls of AID Analysis," Journal of Marketing Research, Vol. 9 (1975), pp. 408- 413.

12. Doyle and Fenwick, p. 409.

13. McCombs, p. 9.

14. Newspaper Research Journal, Vol. 4, No. 4 (1983).

15. Maxwell McCombs, "Newspaper Readership and Circulation," ANPA News Research Report, No. 3, 27 May 1977.

16. Judee Burgoon and Michael Burgoon, "The Functions of the Daily Newspaper," Newspaper Research Journal, Vol. 2, No. 4 (1981) pp. 29-39. Also see Charles Atkin, "Instrumental Utilities and Information Seeking," in New Models for Communication Research, ed. Peter Clark (Beverly Hills: Sage Publications, 1973), pp. 205-242.

17. E. F. Einsiedel and Namjun Kang, "Civic Attitudes Among Non-Readers and Non-Subscribers," Newspaper Research Journal, Vol. 4, No. 4 (1983), pp. 37-42.

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19. Leo Goodman, "A Modified Multiple Regression Approach to the Analysis of Dichotomous Variables," American Sociological Review, Vol 37, (1972), pp. 28-46. Also, Leo Goodman, "A General Mode for the Analysis of Surveys," American Journal of Sociology, 1972.

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21. Leo Goodman, Analyzing Qualitative/Categorical Data: Log-Linear Models and Latent Structure Analysis, (Cambridge: Abt Books), 1978.

22. Jon Miller and Ellen Dran, "The Readership of Science Magazines: A Study of the Role of Issue Attentiveness," Paper presented to the 1983 meeting of the Midwest Association for Public Opinion Research, 18 November 1983.